

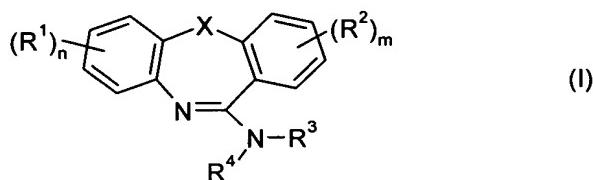
Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-9 (Canceled)

Claim 10 (New) A method for combating or controlling insects, arachnids or nematodes comprising contacting an insect, arachnid or nematode or their food supply, habitat or breeding grounds with a pesticidally effective amount of at least one compound of formula I or a composition comprising at least one compound of formula I:



wherein

X is sulfur, oxygen, sulfinyl (S=O), sulfonyl (SO₂), NR^a, or CR^bR^c;

R^a is hydrogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, or C₂-C₆-alkynyl, wherein the carbon atoms in these groups may be substituted by 1 to 3 groups R[#] wherein

R[#] is halogen, cyano, nitro, hydroxy, mercapto, amino, C₁-C₆-alkylcarbonylamino, carboxyl, C₁-C₆-alkyl, C₁-C₆-alkoxy, C₂-C₆-alkenyloxy, C₂-C₆-alkynyloxy, C₁-C₆-haloalkoxy, or C₁-C₆-alkylthio;

phenyl or benzyl, each unsubstituted or substituted with any combination of 1 to 5 halogen, 1 to 3 C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkylthio, C₁-C₆-haloalkylthio, C₁-C₆-alkoxy or C₁-C₆-haloalkoxy groups;

R^b,R^c are each independently hydrogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₁-C₆-hydroxyalkyl, wherein the carbon atoms in these groups may be substituted by 1 to 3 groups R[#], or

phenyl, unsubstituted or substituted with any combination of 1 to 5 halogen, 1 to 3 C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy or C₁-C₆-haloalkoxy groups, or

CR^bR^c represents C=O or C=CR^jR^k, wherein R^j and R^k each independently are hydrogen, halogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, or C₃-C₆-cycloalkyl;

R¹,R² are each independently halogen, hydroxy, mercapto, amino, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-alkoxy, C₁-C₆-alkylamino, di(C₁-C₆-alkyl)amino, C₁-C₈-alkylthio, C₂-C₆-alkenyl, C₂-C₆-alkenyloxy, C₂-C₆-alkenylamino, C₂-C₆-alkenylthio, C₂-C₆-

alkynyl, C₂-C₆-alkynylloxy, C₂-C₆-alkynylamino, C₂-C₆-alkynylthio, C₁-C₆-alkylsulfonyl, C₁-C₆-alkylsulfoxyl, C₂-C₆-alkenylsulfonyl, C₂-C₆-alkynylsulfoxyl, formyl, C₁-C₆-alkylcarbonyl, hydroxycarbonyl, C₁-C₆-alkoxycarbonyl, carbonyloxy, C₁-C₆-alkylcarbonyloxy, phenoxy, C₁-C₆-alkylcarbonylamino, C(O)NR^dR^e, or (SO₂)NR^dR^e, wherein the carbon atoms in the aliphatic and aromatic groups may be substituted by 1 to 3 groups R[#] and wherein R^d and R^e are each independently groups as listed for R^a; or

C(=NOR^f)-G_p-R^f, wherein R^f and R^f are each independently hydrogen or C₁-C₆-alkyl, G is oxygen, sulfur or NR^f and p is 0 or 1; or

a mono- or bicyclic 5- to 10-membered aromatic ring system which may contain 1 to 4 heteroatoms selected from oxygen, sulfur and nitrogen and which is unfused or fused to the aromatic group to which it is bonded and which, when unfused, is bonded directly or through an oxygen, sulfur, C₁-C₆-alkyl, or C₁-C₆-alkoxy linkage, and which is unsubstituted or substituted with any combination of 1 to 5 groups R[#]; or

C₃-C₁₂-cycloalkyl, which is bonded directly or through an oxygen, sulfur or C₁-C₆-alkyl linkage, and which is unsubstituted or substituted with any combination of 1 to 5 groups R[#];

R³,R⁴ are each independently hydrogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkylamino, C₁-C₆-alkoxy, C₃-C₆-cycloalkyl, wherein the carbon atoms in these groups may be substituted with any combination of 1 to 3 groups R[#], or C(O)R^g, C(O)NR^hRⁱ, or C(S)NR^hRⁱ,

R^g is hydrogen, C₁-C₆-alkyl, C₁-C₆-alkoxy, or

phenyl or benzyl, each unsubstituted or substituted with any combination of 1 to 5 halogen, 1 to 3 C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkylthio, C₁-C₆-haloalkylthio, C₁-C₆-alkoxy or C₁-C₆-haloalkoxy groups;

R^h,Rⁱ are each independently groups as listed for R^a;

or R³ and R⁴ together with the nitrogen atom to which they are attached form a saturated or partially saturated mono- or bicyclic 5- to 10-membered ringsystem containing 1 to 3 heteroatoms selected from nitrogen and oxygen or 5-membered hetaryl containing 1 to 4 nitrogen atoms, wherein the carbon and/or nitrogen atoms in the saturated, partially saturated or aromatic rings are unsubstituted or substituted with any combination of 1 to 4 groups selected from amino, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₁-C₆-alkoxy, C₂-C₆-alkenyloxy, C₂-C₆-alkynylloxy, C₁-C₆-alkylthio, C₂-C₆-alkenylthio, C₂-C₆-alkynylthio, C₁-C₆-alkylamino, di(C₁-C₆-alkyl)amino, C₂-C₆-alkenylamino, C₂-C₆-alkynylamino, C₁-C₆-hydroxyalkyl, hydroxycarbonyl-C₁-C₄-alkyl, C₁-C₆-alkoxycarbonyl-C₁-C₄-alkyl, formyl-C₁-C₄-alkyl, formyl-C₁-C₄-alkoxy, C₁-C₆-alkylcarbonyl-C₁-C₄-alkoxy, C₃-C₆-cycloalkyl, which is bonded directly or via an oxygen, sulfur or C₁-C₆-alkyl linkage, and C₅-C₈-cycloalkenyl, wherein the carbon

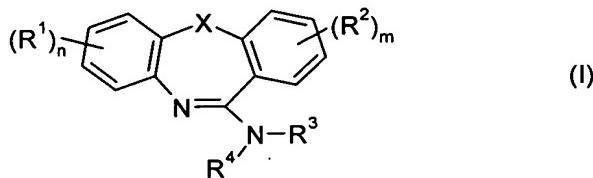
atoms in these aliphatic groups can be substituted by 1 to 4 groups selected from halogen, cyano, hydroxy and nitro; or phenyl or benzyl which may be substituted by halogen, C₁-C₄-alkyl or C₁-C₄-haloalkyl; or R³ and R⁴ together form the chains -(CH₂)₂N⁺(O')(CH₂)₂- or -(CH₂)₃N⁺(O')(CH₂)₂-;

m is 0, 1, 2, 3 or 4;

n is 0, 1, 2, 3 or 4;

or the enantiomers or diastereomers, salts or esters thereof.

Claim 11 (New) A method for protecting growing plants from attack or infestation by insects, arachnids or nematodes comprising contacting a plant, or soil or water in which the plant is growing, with a pesticidally effective amount of at least one compound of formula I or a composition comprising at least one compound of formula I:



wherein

X is sulfur, oxygen, sulfinyl (S=O), sulfonyl (SO₂), NR^a, or CR^bR^c;

R^a is hydrogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, or C₂-C₆-alkynyl, wherein the carbon atoms in these groups may be substituted by 1 to 3 groups R[#] wherein

R[#] is halogen, cyano, nitro, hydroxy, mercapto, amino, C₁-C₆-alkylcarbonylamino, carboxyl, C₁-C₆-alkyl, C₁-C₆-alkoxy, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₁-C₆-haloalkoxy, C₁-C₆-alkylthio, or C₁-C₆-alkylthio;

phenyl or benzyl, each unsubstituted or substituted with any combination of 1 to 5 halogen, 1 to 3 C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkylthio, C₁-C₆-haloalkylthio, C₁-C₆-alkoxy or C₁-C₆-haloalkoxy groups;

R^b,R^c are each independently hydrogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₁-C₆-hydroxyalkyl, wherein the carbon atoms in these groups may be substituted by 1 to 3 groups R[#], or

phenyl, unsubstituted or substituted with any combination of 1 to 5 halogen, 1 to 3 C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkoxy or C₁-C₆-haloalkoxy groups, or

CR^bR^c represents C=O or C=CR^jR^k, wherein R^j and R^k each independently

are hydrogen, halogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, or C₃-C₆-cycloalkyl;

R¹,R² are each independently halogen, hydroxy, mercapto, amino, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-alkoxy, C₁-C₆-alkylamino, di(C₁-C₆-alkyl)amino, C₁-C₆-alkylthio, C₂-C₆-alkenyl, C₂-C₆-alkenyloxy, C₂-C₆-alkenylamino, C₂-C₆-alkenylthio, C₂-C₆-alkynyl, C₂-C₆-alkynyloxy, C₂-C₆-alkynylamino, C₂-C₆-alkynylthio, C₁-C₆-alkylsulfonyl, C₁-C₆-alkylsulfoxyl, C₂-C₆-alkenylsulfonyl, C₂-C₆-alkenylsulfoxyl, formyl, C₁-C₆-alkylcarbonyl, hydroxycarbonyl, C₁-C₆-alkoxycarbonyl, carbonyloxy, C₁-C₆-alkylcarbonyloxy, phenoxy, C₁-C₆-alkylcarbonylamino, C(O)NR^dR^e, or (SO₂)NR^dR^e, wherein the carbon atoms in the aliphatic and aromatic groups may be substituted by 1 to 3 groups R[#] and wherein R^d and R^e are each independently groups as listed for R^a; or

C(=NOR^f)-G_p-R^f, wherein R^f and R^f are each independently hydrogen or C₁-C₆-alkyl, G is oxygen, sulfur or NR^f and p is 0 or 1; or

a mono- or bicyclic 5- to 10-membered aromatic ring system which may contain 1 to 4 heteroatoms selected from oxygen, sulfur and nitrogen and which is unfused or fused to the aromatic group to which it is bonded and which, when unfused, is bonded directly or through an oxygen, sulfur, C₁-C₆-alkyl, or C₁-C₆-alkoxy linkage, and which is unsubstituted or substituted with any combination of 1 to 5 groups R[#]; or

C₃-C₁₂-cycloalkyl, which is bonded directly or through an oxygen, sulfur or C₁-C₆-alkyl linkage, and which is unsubstituted or substituted with any combination of 1 to 5 groups R[#];

R³,R⁴ are each independently hydrogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkylamino, C₁-C₆-alkoxy, C₃-C₆-cycloalkyl, wherein the carbon atoms in these groups may be substituted with any combination of 1 to 3 groups R[#], or C(O)R^g, C(O)NR^hRⁱ, or C(S)NR^hRⁱ,

R^g is hydrogen, C₁-C₆-alkyl, C₁-C₆-alkoxy, or

phenyl or benzyl, each unsubstituted or substituted with any combination of 1 to 5 halogen, 1 to 3 C₁-C₆-alkyl, C₁-C₆-haloalkyl, C₁-C₆-alkylthio, C₁-C₆-haloalkylthio, C₁-C₆-alkoxy or C₁-C₆-haloalkoxy groups;

R^h,Rⁱ are each independently groups as listed for R^a;

or R³ and R⁴ together with the nitrogen atom to which they are attached form a saturated or partially saturated mono- or bicyclic 5- to 10-membered ringsystem containing 1 to 3 heteroatoms selected from nitrogen and oxygen or 5-membered hetaryl containing 1 to 4 nitrogen atoms, wherein the carbon and/or nitrogen atoms in the saturated, partially saturated or aromatic rings are unsubstituted or substituted with any combination of 1 to 4 groups selected from amino, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₁-C₆-alkoxy, C₂-C₆-alkenyloxy, C₂-C₆-alkynyloxy, C₁-C₆-alkylthio, C₂-C₆-alkenylthio, C₂-C₆-alkynylthio, C₁-C₆-alkylamino, di(C₁-C₆-alkyl)amino, C₂-C₆-alkenylamino, C₂-C₆-alkynylamino, C₁-C₆-

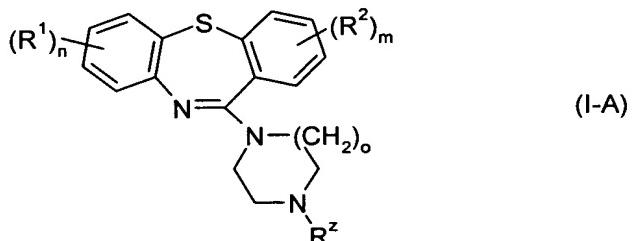
hydroxyalkyl, hydroxycarbonyl-C₁-C₄-alkyl, C₁-C₆-alkoxycarbonyl-C₁-C₄-alkyl, formyl-C₁-C₄-alkyl, formyl-C₁-C₄-alkoxy, C₁-C₆-alkylcarbonyl-C₁-C₄-alkoxy, C₃-C₆-cycloalkyl, which is bonded directly or via an oxygen, sulfur or C₁-C₆-alkyl linkage, and C₅-C₈-cycloalkenyl, wherein the carbon atoms in these aliphatic groups can be substituted by 1 to 4 groups selected from halogen, cyano, hydroxy and nitro; or phenyl or benzyl which may be substituted by halogen, C₁-C₄-alkyl or C₁-C₄-haloalkyl; or R³ and R⁴ together form the chains -(CH₂)₂N⁺(O⁻)(CH₂)₂- or -(CH₂)₃N⁺(O⁻)(CH₂)₂-;

m is 0, 1, 2, 3 or 4;

n is 0, 1, 2, 3 or 4;

or the enantiomers or diastereomers, salts or esters thereof.

Claim 12 (New) Compounds of formula I-A



wherein

R¹, R² are each independently halogen, hydroxy, mercapto, amino, cyano, nitro, C₁-C₆-alkyl, C₁-C₆-alkoxy, C₁-C₆-alkylamino, di(C₁-C₆-alkyl)amino, C₁-C₈-alkylthio, C₂-C₆-alkenyl, C₂-C₆-alkenyloxy, C₂-C₆-alkenylamino, C₂-C₆-alkenylthio, C₂-C₆-alkynyl, C₂-C₆-alkynyoxy, C₂-C₆-alkynylamino, C₂-C₆-alkynylthio, C₁-C₆-alkylsulfonyl, C₂-C₆-alkenylsulfonyl, formyl, or C₁-C₆-alkylcarbonyl, wherein the carbon atoms in the aliphatic and aromatic groups may be substituted by 1 to 3 groups selected from halogen, cyano, nitro, hydroxy, mercapto, amino, C₁-C₆-alkyl, C₁-C₆-alkoxy, C₂-C₆-alkenyloxy, C₂-C₆-alkynyoxy, C₁-C₆-haloalkoxy, or C₁-C₆-alkylthio;

R^z is hydrogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₁-C₆-hydroxyalkyl, C₃-C₆-cycloalkyl, C₃-C₆-cycloalkyl-C₁-C₆-alkyl, or C₅-C₈-cycloalkenyl, wherein the carbon atoms in these aliphatic groups can be substituted by 1 to 4 groups selected from halogen, cyano, hydroxy and nitro; and wherein the group [N-R^z] may be present as amine oxide [N⁺(O⁻)-R^z];

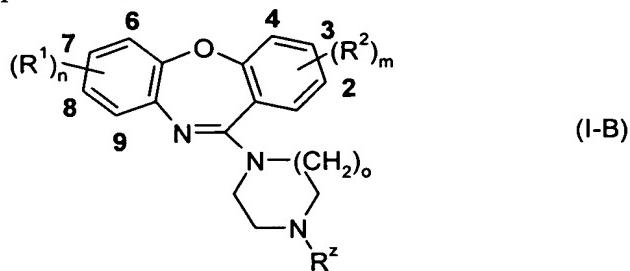
m is 1, 2, 3, or 4;

n is 1, 2, 3, or 4; and

o is 1 or 2.

Claim 13 (New) Compounds of formula I-A according to claim 12 wherein R¹ and R² each independently are halogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, methoxy, C₁-C₆-haloalkoxy, C₁-C₈-alkylthio, C₁-C₆-haloalkylthio, C₂-C₆-alkenylthio, or C₂-C₆-alkynylthio.

Claim 14 (New) Compounds of formula I-B



(I-B)

wherein

R^z is hydrogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₁-C₆-hydroxyalkyl, C₃-C₆-cycloalkyl, C₃-C₆-cycloalkyl-C₁-C₆-alkyl, or C₅-C₈-cycloalkenyl, wherein the carbon atoms in these aliphatic groups can be substituted by 1 to 4 groups selected from halogen, cyano, hydroxy and nitro; and wherein the group [N-R^z] may be present as amine oxide [N^{+(O^-)-R^z}];

m is 1, 2, 3, or 4;

n is 1, 2, 3, or 4; and

o is 1 or 2

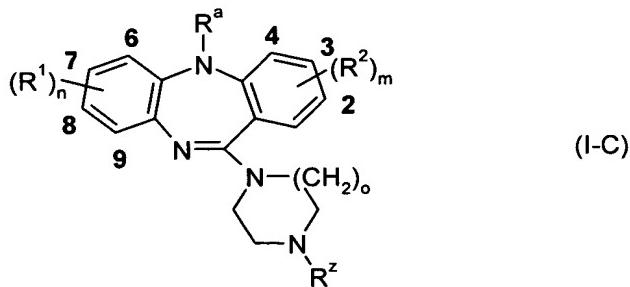
and R¹ and R² each independently are halogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, methoxy, C₁-C₆-haloalkoxy, C₁-C₈-alkylthio, C₁-C₆-haloalkylthio, C₂-C₆-alkenylthio, or C₂-C₆-alkynylthio, with the proviso that

when R¹ is 2-chloro then R² is not 8-chloro or 8-methoxy; and

when R¹ is 4-chloro then R² is not 8-chloro; and

when R¹ is 4-methyl then R² is not 7-, 8-, or 9-chloro.

Claim 15 (New) Compounds of formula I-C



(I-C)

wherein R^a is hydrogen or C₁-C₆-alkyl and

R^z is hydrogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₁-C₆-hydroxyalkyl, C₃-C₆-cycloalkyl, C₃-C₆-cycloalkyl-C₁-C₆-alkyl, or C₅-C₈-cycloalkenyl, wherein the carbon atoms in these aliphatic groups can be substituted by 1 to 4 groups selected from halogen, cyano, hydroxy and nitro; and wherein the group [N-R^z] may be present as amine oxide [N^{+(O^-)-R^z}];

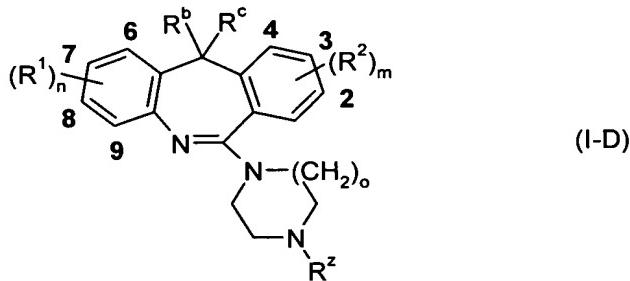
m is 1, 2, 3, or 4;

n is 1, 2, 3, or 4; and

o is 1 or 2

and R¹ and R² each independently are halogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, methoxy, C₁-C₆-haloalkoxy, C₁-C₈-alkylthio, C₁-C₆-haloalkylthio, C₂-C₆-alkenylthio, or C₂-C₆-alkynylthio, with the proviso that
not both of R¹ or R² are halogen and
when R¹ is 2-chloro then R² is not 8-methyl, 8-methylthio, or 8-methoxy; and
when R¹ is 2-methoxy, then R² is not 8-chloro; and
when R¹ is 2-methyl then R² is not 8-chloro.

Claim 16 (New) Compounds of formula I-D



wherein R^b and R^c are each independently hydrogen, methyl or CR^bR^c represents C=CH₂, and

R^z is hydrogen, C₁-C₆-alkyl, C₂-C₆-alkenyl, C₂-C₆-alkynyl, C₁-C₆-hydroxyalkyl, C₃-C₆-cycloalkyl, C₃-C₆-cycloalkyl-C₁-C₆-alkyl, or C₅-C₈-cycloalkenyl, wherein the carbon atoms in these aliphatic groups can be substituted by 1 to 4 groups selected from halogen, cyano, hydroxy and nitro; and wherein the group [N-R^z] may be present as amine oxide [N^{+(O⁻)}-R^z];

m is 1, 2, 3, or 4;
n is 1, 2, 3, or 4; and
o is 1 or 2

and R¹ and R² each independently are halogen, C₁-C₆-alkyl, C₁-C₆-haloalkyl, methoxy, C₁-C₆-haloalkoxy, C₁-C₈-alkylthio, C₁-C₆-haloalkylthio, C₂-C₆-alkenylthio, or C₂-C₆-alkynylthio.

Claim 17 (New) Compositions comprising at least one compound of formula I-A as defined in claim 12 or an enantiomer or diastereomer, salt or ester thereof and an agronomically acceptable carrier.

Claim 18 (New) Compositions comprising at least one compound of formula I-A as defined in claim 13 or an enantiomer or diastereomer, salt or ester thereof and an agronomically acceptable carrier.

Claim 19 (New) Compositions comprising at least one compound of formula I-B as defined in claim 14 or an enantiomer or diastereomer, salt or ester thereof and an agronomically acceptable carrier.

Claim 20 (New) Compositions comprising at least one compound of formula I-C as defined in claim 15 or an enantiomer or diastereomer, salt or ester thereof and an agronomically acceptable carrier.

Claim 21 (New) Compositions comprising at least one compound of formula I-D as defined in claim 16 or an enantiomer or diastereomer, salt or ester thereof and an agronomically acceptable carrier.